UNITED STATES PATENT AND TRADEMARK OFFICE

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10/539,318	06/15/2005	Andreas Johannes Gerrits	NL 021345	2734

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EXAMINER
GODBOLD, DOUGLAS

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *14 January 2009*.
2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-10* is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) *1-10* is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☐ All b) ☐ Some * c) ☐ None of:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____.
      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
         application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)
1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1.   This Office Action is in response to correspondence filed January 14, 2009 in

reference to application 10/539,318. Claims 1-10 are pending in the application and

have been examined.

Response to Arguments

2.   Applicant's arguments filed January 14, 2009 have been fully considered but they

are not persuasive.

3.   In response to applicants arguments, see Remarks pages 2-3, that Tsutsui2

does not teach or suggest "combining amplitudes of frequency components within said

local frequency band from which at least one of the candidate sinusoids within said local

frequency band is excluded," the examiner respectfully disagrees. The applicant argues

that instead, when summing the bands as described in column 13 lines 3-10, Tsutsui2

includes the selected candidate sinusoid. However it is noted that Tsutsui2 says that

the *neighboring* spectrum is summed, which is the spectrum *adjoining* the maximum

value of the spectrum which represents the candidate sinusoid. The language used

here does not suggest to one of ordinary skill in the art to include the candidate sinusoid

band, only the spectrum around it.   This becomes defined as Variable X. As pointed

out by the applicant, Variable Y is the sum of the frequency band maximum spectrum

(candidate sinusoid). If X also included the candidate sinusoid the ratio of X/Y would

always equal 1, rendering Tsutui2 useless.   Therefore Tsutui2 discloses combining

amplitudes of frequency components within said local frequency band from which at least one of the candidate sinusoids within said local frequency band is excluded.

4.   In response to applicants arguments, see Remarks page 3, that Tsutsui2 fails to teach "selecting said candidate sinusoid as a selected sinusoid in dependence of the combination of amplitudes," the examiner respectfully disagrees. As Argued above X which is determined in step s6 of figure 4 is the combination of amplitudes of the surrounding frequency components. Although selecting "selecting said candidate sinusoid as a selected sinusoid in dependence of the combination of amplitudes" is not the language used by Tsutsui2, the registration of tone characteristic components of step s9 is equivalent to the required claim limitations. The registration is a selection in that the spectrum component is selected to be a tone characteristic, and this decision is made at step s8, which requires variable X, the sum of the surrounding spectrum. Therefore Tsutsui2 teaches selecting said candidate sinusoid as a selected sinusoid in dependence of the combination of amplitudes.

Claim Rejections - 35 USC § 101

5.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6.   Claims 1-7 are rejected under 35 U.S.C. 101 as not falling within one of the four
statutory categories of invention.   Supreme Court precedent[1] and recent Federal Circuit
decisions[2] indicate that a statutory "process" under 35 U.S.C. 101 must (1) be tied to
another statutory category (such as a particular apparatus), or (2) transform underlying
subject matter (such as an article or material) to a different state or thing. While the
instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither
transform underlying subject matter nor positively tie to another statutory category that
accomplishes the claimed method steps, and therefore do not qualify as a statutory
process.   For example in claim 1, a human being could perform the steps of analysis by
hand on an audio signal that was notated on a piece of paper, either by graphing the
waveform, or by working from a spectrum plot of the signal and completing the
mathematical operations by hand. No device or processor is necessary to complete the
steps of the methods described in these claims.

7.   Claims 8-10 are rejected under 35 U.S.C. 101 because the claimed invention is
directed to non-statutory subject matter. Claims 8-10 describe audio encoders or audio
systems comprising various means for completing tasks. However as indicated by the
specification page 10 lines 15-24 the systems and encoders may be implemented in
software. Therefore the claims can be reasonably construed as software only

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[1] *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).
[2] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

embodiments, which is considered non-statutory under 35 U.S.C 101. Therefore claims

8-10 are rejected as being non-statutory.

Claim Rejections - 35 USC § 102

8.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9.   Claims 1-5, 8, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated

by Tsutsui et al (US Patent 5,717,821) from hereon referred to as Tsutsui2 to avoid

confusion with the Tsutsui reference used in the prior rejection.

10.   Consider claims 1 and 8: Tsutsui2 discloses a method and audio encoder for

encoding an audio signal by representing at least part of said audio signal by a plurality

of sinusoids (see Abstract, frequency components are sinusoids by definition), the

method comprising the steps of:

        performing an analysis on a first segment of said audio signal (waveform is

transformed to frequency components; column 10 lines 37-40);

        selecting candidate sinusoids based on said analysis (N spectrum signals

inputted into tone separating component; column 12 line 24. A component is

considered when its amplitude is greater to that of surrounding amplitudes when locally

view; column 12 line 30);

defining for at least one of the candidate sinusoids a local frequency band around

a frequency of said at least one candidate sinusoid (neighboring spectrum components;

column 12 line 36);

combining amplitudes of frequency components within said local frequency band

from which at least one of the candidate sinusoids within the local frequency band is

excluded (Figures 4, Step 6, energy value of neighboring spectrum is summed; column

13 lines 3-6.); and

selecting said candidate sinusoid as a selected sinusoid in dependence on the

combination of amplitudes (Steps S8 and S9, where ratio is considered and tonality is

registered; column 13 lines 3-35.).

11.   Consider claim 2: Tsutsui2 discloses a bandwidth of said local frequency band

around the frequency of said at least one candidate sinusoid is defined in dependence

on the frequency of said at least one candidate sinusoid (Figure 5 shows the bands

selected around frequency components B1-B5 that grow wider as they get higher, also

column 2 lines 10-28).

12.   Consider claim 3: Tsutsui2 discloses dependence on the frequency of said

candidate sinusoid is based on a human's perception of audio (see column 2 lines 10-

28, where Tsutsui discusses taking the characteristics of human hearing into account).

13.   Consider claim 4: Tsutsui2 discloses candidate sinusoid is selected as a selected sinusoid when its amplitude of said candidate sinusoid is significant with regard to said combination of amplitudes (Figures 4, Step 6, energy value of neighboring spectrum is summed; column 13 lines 3-6.), said significance being evaluated by thresholding a difference between the amplitude of said candidate sinusoid and a weighted mean amplitude of frequency components within the local frequency band of said candidate sinusoid from which at least one of the candidate sinusoids within said local frequency band is excluded (Steps S8 and S9, where ratio is considered in regards to Threshold R and tonality is registered; column 13 lines 3-35, T).

14.   Consider claim 5: Tsutsui2 discloses candidate sinusoid is selected as a selected sinusoid when an amplitude of said candidate sinusoid is significant with regard to said combination of amplitudes, (Figures 4, Step 6, energy value of neighboring spectrum is summed; column 13 lines 3-6) said significance being evaluated by thresholding a ratio (X/Y) of:

        a difference between the amplitudes of said candidate sinusoid and a weighted mean amplitude of frequency components within the local frequency band of said candidate sinusoid's local frequency band from which at least one of the candidate sinusoids within said local frequency band is excluded; (Figures 4, Step 6, energy value of neighboring spectrum is summed X; column 13 lines 3-6) and

        a weighted deviation of the amplitudes of frequency components within said local frequency band from which at least one of the candidate sinusoids within said local

frequency band is excluded (absolute value of spectrum of band Y; column 13 lines 5-9).

15.   Consider claim 10: Tsutsui2 disclose means for obtaining an audio signal (see Figure 1, 600), an audio encoder for encoding said audio signal to obtain an encoded audio signal (see Figure 1, 601-506), and a formatting unit for formatting the encoded audio signal into a format suitable for storage and/or transmission (606-609).

Claim Rejections - 35 USC § 103

16.   The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

17.   Claims 6, 7, and 9 rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsui2 in view of McAulay et al (US Patent 5,054,072).

18.   Consider claims 6 and 9: Tsutsui2 does not specifically disclose a further selection out of the selected sinusoids which comprises the steps of:

        determining for at least one of the selected sinusoids a phase consistency defined by an extent to which a phase of said selected sinusoid at a certain moment in time can be predicted from a phase of said selected sinusoid determined at another moment in time; and

further selecting said selected sinusoid as a further selected sinusoid when its

phase consistency is above a predetermined threshold

In the same field of Audio Coding, McAulay teaches a further selection out of the

selected sinusoids which comprises the steps of:

determining for at least one of the selected sinusoids a phase consistency

defined by an extent to which a phase of said selected sinusoid at a certain moment in

time can be predicted from a phase of said selected sinusoid determined at another

moment in time (see Col. 2, lines 26 - 40 where McAulay discusses predicting phases

across frames and Col. 5, lines 10-20, where McAulay discusses the phase calculation);

and

further selecting said selected sinusoid as a further selected sinusoid when its

phase consistency is above a predetermined threshold (see Col. 7, lines 19-27, where

McAulay discusses phase modeling and a required minimum value, therefore a

threshold).

Therefore it would have been obvious to one of ordinary skill in the art at the time

of the invention to consider phase as taught by McAulay in the system of Tsutsui2 in

order to provide a more accurate and realistic sounding coded signal.

19.   Consider claim 7: Tsutsui2 does not specifically disclose determining phase

consistency comprises the steps of:

segmenting a third segment of said audio signal into at least a first and a second

part;

determining the actual phases of said selected sinusoid in at least the first and

the second part;

using the actual phase in the first part to serve as the input for predicting the

actual phase in the second part; and

determining said selected sinusoid's phase consistency based on a prediction

error between the actual phase and the predicted phase in the second part.

In the same field of audio coding McAulay disclose determining phase

consistency comprises the steps of:

segmenting a third segment of said audio signal into at least a first and a second

part (see Col. 8, lines 4-10, where McAulay discusses pitch periods);

determining the actual phases of said selected sinusoid in at least the first and

the second part (see Col. 8, lines 8-15, where McAulay discusses evaluating the phase

after a determination);

using the actual phase in the first part to serve as the input for predicting the

actual phase in the second part (see Col. 8, lines 30-35, where McAulay discusses

determining residual phases); and

determining said selected sinusoid's phase consistency based on a prediction

error between the actual phase and the predicted phase in the second part (see Col. 7,

lines 30-40, where McAulay discusses selection based on minimizing the error).

Therefore it would have been obvious to one of ordinary skill in the art at the time

of the invention to consider phase as taught by McAulay in the system of Tsutsui2 in

order to provide a more accurate and realistic sounding coded signal.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to DOUGLAS C. GODBOLD whose telephone number is

(571)270-1451. The examiner can normally be reached on Monday-Thursday 7:00am-

4:30pm Friday 7:00am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Patrick Edouard can be reached on (571) 272-7603. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

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USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DCG
       /Patrick N. Edouard/
       Supervisory Patent Examiner, Art Unit 2626